DOCUMENT RESUME

ED 231 809 SP 022 695

AUTHOR Leino, Anna-Liisa; Puurula, Arja
TITLE Admission to Teacher Education and Two Cognitive Styles. Research Bulletin 61.
INSTITUTION Helsinki Univ. (Finland). Inst. of Education.
REPORT NO ISBN-951-45-3008-X
PUB DATE 83
NOTE 63p.
PUB TYPE Reports - Research/Technical (143) -- Information Analyses (070)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Admission Criteria; Cognitive Ability; Cognitive Processes; *Cognitive Style; Concept Formation; Convergent Thinking; Divergent Thinking; Education Majors; Foreign Countries; Higher Education; Home Economics Teachers; *Psychological Characteristics; *Schemata (Cognition); *Teacher Education
IDENTIFIERS Finland

ABSTRACT

This study sought information on the relationship between cognitive styles (conceptual level and field-independence/field-dependence) and entrance examination criteria of those accepted to teacher education at the University of Helsinki in 1980. The 96 subjects represented prospective class teachers and teachers of handicraft and home economics. The differences between the cognitive styles of the groups were significant, with prospective teachers of handicraft being relatively the most field-independent and home-economics the most field-dependent. Prospective class teachers had the highest cognitive level and handicraft teachers the lowest, and these cognitive styles were found to be related with the entrance examination criteria. Since conceptual level is a style highly desirable from the viewpoint of the teacher's work, the entrance examination was considered to measure at least some aspects relevant to the prospective teacher's profession. (Author/JD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED231809

Department of Education

University of Helsinki

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

E. Niskanen

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

RESEARCH BULLETIN 61

Anna-Liisa Leino — Arja Puurula

ADMISSION TO TEACHER EDUCATION AND TWO COGNITIVE STYLES

SP022695

Department of Education, University of Helsinki
Head: Erkki A. Niskanen, Professor of Education
Fabianinkatu 28 A, SF-00100 Helsinki 10, Finland

RESEARCH BULLETIN 61

Anna-Liisa Leino — Arja Puurula

ADMISSION TO TEACHER EDUCATION AND TWO COGNITIVE STYLES

Helsinki 1983

ISBN 951-45-3008-X
ISSN 0359-5749
Helsingin yliopiston monistuspalvelu
Painatusjaos Helsinki 1983

Preface

The present study is a part of A-L. Leino's research project, which at one stage was partly financed by the Finnish Academy. The writers are very grateful for this support.

The work between the two writers was divided in the following way: chapters 1, 1.1, 1.2, 2, and 4 were written by A-L. Leino and the rest (1.3, 2.1, 2.2, and 3) by A. Puurula.

The writers wish to express their gratitude to Associate Professor Jarkko Leino for his valuable comments and expert advice concerning statistical operations. The writers also owe a debt of gratitude to Professor Erkki A. Niskanen and Mr. Pentti Holopainen, Ph.D. for reading the manuscript. We are grateful for the inclusion of this study in the Research Bulletin series of Department of Education.

Helsinki, March 1983

Anna-Liisa Leino

Arja Puurula

TABLE OF CONTENTS

1	INTRODUCTION	1
	1.1 Purpose of the study	5
	1.2 Background to the study	6
	1.3 Admission to teacher education	13
2	PROBLEM AREAS	18
	2.1 Variables	20
	2.2 Subjects	24
3	RESULTS	26
	3.1 Conceptual Level	26
	3.2 Field-Independence/Field-Dependence	27
	3.3 Relationships between variables	29
	3.4 Extreme cases of Conceptual Level	33
	3.5 Extreme cases of FI/FD	36
	3.6 Discrepant evaluation of teaching situation	37
4	DISCUSSION	39

REFERENCES

APPENDICES

1 INTRODUCTION

The years following the Second World War were characterized by a great expansion in the need and demand for education all over the world. The new situation caused pressure on the educational systems in many countries, attempts were made to cope with the new tasks and to solve the new problems. The whole post-war era was (and still is) characterized by many kinds of educational reform activities.

In Finland educational reform activities centered mainly around developing the comprehensive school system and a new teacher education system coupled with the degree and syllabus reform at the university level. Plans were also made for the reform of the whole system of vocational education but carrying out these plans seems to lag behind the other changes. The most recent one of the reforms is a kind of modular system that is being applied to senior secondary schools. In the following we will briefly outline the changes that have taken place in our school system to be able to discuss their implications for teacher education in this country.

In our old school system the students who were to continue studying in higher institutions were selected to attend secondary school after four years of primary school ("folkskool") on the basis of a special knowledge test and their previous school reports. These students were considered suitable for theoretical studies. Usually their family background was such that they were expected to go in this direction. Secondary school was consequently only a school of a privileged minority with the great majority going on with studies in "folkschool". Comprehensive school meant a compulsory school common to every child. The introduction of the system was implemented by stages, starting with Lapland in 1972 and ending in Helsinki area in 1977.

Apart from a few cases being taught separately, a single class includes now pupils with a wide range of aptitudes, interests and other individual characteristics. There is more heterogeneity within a single class than previously. The school reform (as well as other changes in society) meant great changes in the functions and role of teachers.

Secondary schools have a long history in Finland. Teacher education for these schools consisted of university examinations and a one-year training period in "normal schools", which were state-owned secondary schools. There were some exceptions, however: the training of the teachers of home economics, handicrafts, sports and gymnastics as well as arts took place in special institutions, which were not academic. The purpose of the education of secondary school teachers was to train them to teach the select few.

Compulsory schooling was of far more recent origin. It was officially introduced in Finland in 1921, and it had the role of a "parallel" school to the "academic" school. Primary or elementary school teachers took no academic examinations; they only had to learn what they were later to teach others. Teacher education was very practical. It was provided in different seminaries (teachers' colleges) in the form of courses of varying length depending on the basic training of the prospective teacher.

There was a sharp boundary between the two groups of teachers at least partly caused by the kind of training they received. Secondary school teachers (subject teachers) got a narrow and deep education in two (or three) subjects with very limited studies in pedagogics. The elementary school teachers (class teachers) received education which was broad and shallow with emphasis on practical pedagogics.

In order to have adjustments made concerning class teacher and subject teacher education to the requirements of the new school system the Ministry of Education appointed a

committee to plan the degree and syllabus reform to teacher education in 1973. The committee worked under the chairmanship of Professor Erkki A. Niskanen and submitted its final report to the Minister of Education in 1975.

The principles of development as expressed by the committee were as follows:

- the education of all comprehensive school and senior secondary school teachers should be academic, take place in universities and other institutions of higher education
- the education of different teacher categories should be homogenized
- the status of pedagogical studies should be redefined, meaning that teachers' pedagogical expertise should increase, theoretical and practical studies should be integrated, and pedagogical and subject studies should be more closely connected than before
- components of social policy and educational policy should be increased in teacher education
- teacher education should be regarded as a continuous, recurrent process

The general aims of teacher education center around society in general, the individual pupil, fields of knowledge and teaching process. They are as follows:

1. The teacher should be able to analyze the development of society and be aware of the social consequences of his work. He should be able to contribute to the welfare, freedom, security, enjoyment and development of the members of society in accordance with the principles laid down in the United Nations' Universal Declaration of Human Rights.
2. The teacher should be able to analyze the general and individual factors that affect the development of the pupil and apply this knowledge in his efforts to help the pupil to adjust himself to society and promote

the development of the whole personality as an independent individual.

3. The teacher should have such a mastery of the terminology and structural components of his subject as to be able to pass on the most essential information to the pupils, to guide them in various tasks and to follow the most recent developments in his field.
4. The aims related to the teaching situation have been reduced to one general objective, from which several intermediate objectives can be derived: the teacher should be an expert in his subject and in education, i.e. a specialist in teaching.

The reform means that all teachers of comprehensive school and senior secondary school will get an academic education and degree. Some organisational changes were necessary to fulfill the purpose: old seminaries (teachers' colleges), "normal school" and institutions for the training of special groups of teachers (domestic science and handicraft) were attached to the universities within the newly founded faculties of education (behavioural sciences). The institutions responsible for the training of music and art teachers remained administratively independent but they have to co-operate with departments of teacher education on matters of common interest to both parties. The prospective class teachers get all their training within faculties of education, whereas subject teachers do only their pedagogical studies there and the subjectwise studies in the respective faculties (or institutions).

1.1 Purpose of the study

Nowadays it is nearly a commonplace to say that those who study to be teachers should be suitable for the profession to be successful as teachers later on. The terms "suitable" and "successful" seem to resist definition, a situation that is further complicated by the fact that they should not only refer to teachers themselves but also to the whole context of school and education. Here we have a wide area of problems which abounds in studies. Marklund and Gran pointed out in 1974 that the number of studies in the area during the past fifty years was presumably running into four figures. To give some structure on the diffuse area they proposed a chronological sequence from teacher education to teaching as a practical way of classifying different criteria (p. 61):

1. Selection criteria for admission to teacher education with predetermined goals.
2. Educational criteria, i.e. processes and resources in the course of teacher education.
3. Qualification criteria, e.g. subject knowledge, knowledge of educational theory and teaching proficiency in the practical exercises coming at the end of the course of teacher education.
4. Teacher behaviour and the teacher role in the practice of the teaching profession after the completion of teacher education.
5. The results achieved by the teacher's pupils, including both cognitive and non-cognitive results.

A general purpose of the present study is to get information of the cognitive styles of those accepted to teacher education; more specifically, the study will be mainly limited to the first group of criteria i.e. the selection criteria and their relationship with two cognitive styles (Conceptual Level and Field-Independence/Field-Dependence). Some of the other criteria will only be touched upon in terms of

case studies. Carrying out the research project in the form it was originally planned (Leino, A-L. 1980) has been seriously impeded by lack of resources.

1.2 Background to the study

Giving attention to student differences has been a well established tradition in literature and research dealing with learning. Until very recently the focus of interest has been on intelligence, motivation, attitudes and interests as well as various temperamental traits. Of far more recent origin is the realization of the pedagogical importance of cognitive processes and styles. Research into this area has only just begun in Finland (e.g. Leino, A-L. 1980; Leino, J. 1981; Leino, A-L. & Leino, J. 1982). Of fairly recent origin is as well the acknowledgement of the variety of teacher experiences. The teacher is without question the key to successful classroom experience, and quite obviously different patterns of teacher characteristics have important impact on teaching/learning situation.

When thinking of teacher characteristics (of which we only deal with two cognitive styles) a natural starting-point is the quality of teaching/learning situation, which places certain demands on the teacher. In the following we will deal with teaching/learning situation as multidirectional interaction and give a brief review of research relevant to the idea.

Teaching/learning situation is regardless the age of students an interaction process. In order to understand its nature better we need to specify the term interaction. Salomon (1981) has discussed the various meanings that researchers attach to it. He emphasizes the idea, previously expressed by others (e.g. Bandura 1978; Hunt 1976) of interaction as reciprocal influences or interdependencies of influences.

He speaks of multidirectional interactionism as opposed to unidirectional. According to the latter conception of the term, learning outcomes (B) are supposed to be a function of person (P) and environment (E), B=f(P,E). This view of interaction does not include the idea of behavior B having a reciprocal influence on either personality P or environment E. The multidirectional view, presupposes on the other hand, behaviors, person characteristics and environments to affect one another reciprocally. Applied to school situation this means e.g. that the outcomes, affected by a combination of student characteristics and the classroom climate, affect the climate in turn. Thus B=f(P,E), P=f(B,E) and E=f(B,P), cf. Hunt and Sullivan (1974). Bandura (1978) has called such multidirectional interactions reciprocal determinism and offered the following model to describe it:

Salomon (1981, 25 - 26) has developed Bandura's model further. His conception of reciprocal interaction is based upon that of unidirectional interaction, which is mainly concerned with personality and environment affecting behaviour:

The reciprocal interactions are presented in the following figure with the dashed arrows added:

(The obvious printer's error concerning the direction of the dashed arrows which appeared in the original is corrected in the figure above.)

Salomon (1981) calls unidirectional interactions Level I, and reciprocal ones, which build upon that level, Level II interactions. Studying Level II interactions is problematic. The only possibility seems to be to study Level I interaction in a sequence. After studying the output variables of one study as input variables in another might give a rough picture of reciprocal influences.

Research that has been deliberately designed and adequately carried out to demonstrate how reciprocity operates in teaching/learning situation is scanty and fragmentary. One type of relevant research is illustrated by studies of teacher expectations. A number of studies indicate that teacher expectations are communicated to students, affect their behaviour, and turn the expectations into self-fulfilling prophesies (e.g. Braun 1976; Cooper 1979). Although expectancy manipulation has in many researches been confined to the teacher, some have been predicated on the idea that a student's expectations about his/her teacher could be transmitted to the teacher and bring about behavior congruent with expectations (Feldman and Prahaska 1979; Rappaport and Rappaport 1975).

Apart from such general assumptions that some teachers are more strongly guided by their expectations than others (e.g. Brophy and Good 1974) there is very little specific information concerning the subject. We do not know e.g. how expectancies are generated in the teacher's

mind, and how they are communicated to their children. We do not know the nature of the variables that affect teacher suggestibility and pupil response to cues. It is, however, reasonable to assume that one relevant group of factors would be cognitive styles or information processing styles as they can also be called.

Research evidence shows quite clearly that they influence how students learn, how teachers teach, how students and teachers interact and also how students make career choices (e.g. Witkin et al. 1977; Messick 1978, 1982).

Conceptual Level (CL), which is originally based on Conceptual Systems Theory (Harvey et al. 1961), can be assumed to be one of the most relevant styles in this connection. CL is a person characteristic referring to both cognitive complexity (differentiation and integration) and interpersonal maturity (increasing self-responsibility). It is concerned with individual differences in information processing, the way a person "reads" environmental events (see Hunt e.g. 1971, 1975). Since it is concerned with social stimuli of the environment it can be considered to be particularly relevant from the point-of-view of teaching/learning process including expectations. Persons high on CL are more flexible, creative and tolerant of stress than persons low on it. Flexibility, creativity and tolerance of stress are characteristics quite obviously highly desirable in a teacher.

David E. Hunt has done pioneering work in developing CL-theory and expressed the idea of multidirectional interactionism as reciprocal interactionism (Hunt 1976). He studied "student pull", that is how students influence teachers, and the variations among teachers in their susceptibility to such pull. He described teacher's reactions to student "pull" in terms of "reading" (being sensitized to the student) and "flexing" (modulating to perceived student frame of reference). These two components

of the ongoing teacher adaptation process have an empirical basis (Hunt 1976, 271). Studying student "pull" effects also reverses the position of the variables: student behaviour becomes the independent variable and teacher behaviour the dependent variable.

Hunt and Joyce (1981) have carried out two small-scale studies of the relationship between the personality of teacher trainees and their initial pattern or style of teaching. The capacity to utilize a variety of teaching patterns under appropriate circumstances was considered to be a skill important for the effective teacher. The researchers focused on the reflective style, which is one that utilizes the learner's frame of reference to encourage questioning. Their tentative assumption was that, if a teacher trainer can radiate a reflective environment he/she will have expanded his/her repertoire since the reflective pattern occurs very rarely in teaching. The major dimension of personality based on the Conceptual Systems Theory (see Harvey et al. 1961) is Conceptual Level. The hypothesis was that, for new teacher trainees, the occurrence of reflective teaching patterns is directly related to the trainer's Conceptual Level - the higher the CL, the greater the occurrence of the reflective pattern. The hypothesis was confirmed in the two studies. The researchers emphasize that they consider the relations, which have also been established in other studies, to hold for initial pattern and that they should not be considered to imply that they cannot be changed through training.

Other research results indicate that high CL teacher trainees have a greater tendency to help a student to evaluate information and generate new hypothesis than low CL trainees. High CL trainees also prefer to teach using the example-rule order while low CL trainees are more likely to use rule-example order, a structured approach which is more profitable for low CL students. Hunt (1977-78), however,

points out that trainee preferences were assessed early in the training period, and can be changed, which is in fact a challenge for teacher education in the case of low CL trainees. Their repertory of teaching patterns or styles needs obviously to be extended.

As regards other cognitive styles, Wu (in Messick 1978) found that relatively field-dependent teachers prefer a discussion method of teaching to lecturing or discovery methods which were liked better by relatively field-independent teachers. The result reflects the tendency of field-dependent persons to seek interpersonal involvement which is more obvious in a discussion approach than in the more directive lecturing and discovery situation. Ohnmacht (in Messick 1978) found that relatively field-dependent teachers have a more favourable attitude toward the use of democratic classroom procedures than do field-independent teachers, who are more direct in their attempt to influence students.

Information concerning cognitive styles have been utilized in the so-called matching models, which have been based either on students' cognitive styles or on both teachers' and students' styles. In the former case it is the student's cognitive style that forms the basis of the teacher adaptation process, not necessarily giving attention to the teacher's style. In this case students' style can be matched (or mismatched) e.g. with some qualities of learning materials (see e.g. Entwistle 1981, 95; Frank and Davis 1982). Hunt (1975) speaks of contemporaneous and developmental matching. The purpose of the former is to facilitate immediate learning while the latter concentrates on long-term developmental goals. The cognitive style that has proved fruitful for matching purposes is Conceptual Level, in itself a long-term developmental goal (see Hunt et al. 1978). Low CL students have been found to profit more from a high structured environment and high CL students more from a less structured environment or to be less affected by variations in the structure. Research on other cognitive styles has not yielded such consistent results (for references see Leino, A-L 1980).

As to the general classroom atmosphere there is some research evidence to indicate that teachers and students who are similar in cognitive style communicate more effectively and tend to view each other with greater mutual esteem than those who are dissimilar (Messick 1978, 1982). Research in this field has been mainly concerned with one style characteristic; patterns of styles have not been studied in their relation to teacher classroom behaviour. An interesting research problem would be to find out teachers' cognitive profiles in the same way as Letteri (e.g. 1982) has done with students. The ultimate aim of such a study could, quite obviously, not be any matching procedure, but making teachers (and students) aware of stylistic differences. Such awareness might be of great help to attenuate mismatch-effects and contribute to a more pleasant teaching/learning situation.

The whole idea of matching is very problematic involving the aims or long-term goals and immediate or short-term objectives. If we set aside such a macro-level question as what is to be the proper balance between contemporaneous (facilitating immediate learning) and developmental matching (facilitating long-term development), we are still left with a related micro-level question of what is to be the basis for matching strategies in the teaching/learning situations of various school subjects. On what basis should matching be made and to what end? Should we e.g. use it as a means of compensating for learner weaknesses of capitalizing on the learner's strengths? Questions like these are inseparably involved in the values prevailing in society and represent a neglected area of study in education. Systematic analyses of values would be crucial from the viewpoint of setting aims and objectives of education, as well as from that of educational practice (Heikkinen 1981; see also Heikkinen 1982).

In the following we will deal with questions concerning admission to teacher education in Finland.

1.3 Admission to teacher education

Admission to teacher education is a very problematic area in the Finnish educational system on account of increasing numbers of high school graduates and the limited number that universities can take. In 1950 77 % of high school graduates were able to begin their studies in some university after matriculation examination while in 1980 only 44 % were able to do so (Alikoski 1981a, 56; SVT 1981, 14). Teacher education is one of the most popular programmes of study. Yearly more than 6600 high school graduates seek an opportunity to study in some of the six teacher education centres in Finland. About 10 % of applicants may enter the study programme of class teacher education (Perho 1982, 28).

Due to the strict competition, the entry level of the students is high. On the other hand, career motivation of the applicants to teacher education has changed during the 70's. Perho (1982, 267) reports that career motivation of those students that were accepted to teacher training was more extrinsic and casual in 1976 than 1971. The entrance examination covers hardly any aspects of career motivation of a kind important to success as a teacher, claims Perho. The process of a student's occupational choice is not fully conscious. (see also Komulainen 1979)

The selection system is originally partly based on the way of admitting prospective "folkschool" teachers into teacher's colleges. The present system of student selection is guided and directed by the recommendations given by the Ministry of Education (Opetusministeriö 1977). They are directed to all universities with teacher education. The selection process is under keen control from both administrators and educational researchers. Memorandums concerning selection and proposals for renewals are made in every university each year and improvements are made whenever necessary (Opetusministeriö 1980). More attention has, however, been paid to the selection policy of class teachers than subject teachers.

The selection procedure consists of two stages. The first stage, common to all universities, is based on application papers. A student may send his/her application to no more than three centers of teacher education. Some 25 % of those who send their application are invited to an entrance examination (=the second stage of selection). The selection criteria of the first stage consist mainly of matriculation results, but previous working experience with children, studies in arts, acting as club leaders etc., give some extra points. Furthermore, a small quota is reserved in each university for special groups like those who have not taken matriculation examination, Lapps, those confessing orthodox religion, and applicants who have acted several years as unqualified teachers.

The second stage consists of either a short teaching situation or a task that requires structuring and referring to written material. In both cases an applicant is allowed an hour to plan the task. A committee of three experienced university teachers evaluate the aptitude of the student, his sociability, flexibility and the logic in dealing with the theme in question. They have detailed instructions for the evaluation according to which they each give their own opinion of the student's performance.

Of these two different forms of entrance examination (a short teaching situation and structuring/referring task) the former is older and more thoroughly investigated. It is used with applicants for the class teacher's programme of studies, while the latter is mainly in use with applicants for the subject teacher's programme. The studies that have been made on the selection procedure of class teachers seem to indicate that the teaching situation type of test is a firm and valid part of the entrance examination when compared to interviews or paper-and-pencil -tests (Komulainen 1975 and 1977; Hytönen et al. 1978; Alikoski 1981a). (On the validity see, however, chapter 2.1.)

After the short teaching situation an applicant is interviewed by another committee of experienced university teachers. The interview takes 5 - 7 minutes and it concentrates on educational and school-related themes, the hobbies of the applicant and his way of thinking about children and schooling. Questions that are too personal or intimate are not allowed. Both the interview and the teaching situation task are evaluated (separately) from 1 to 5 points.

The structuring type of entrance test is also used in the selection of prospective teachers for home economics, and handicraft. An applicant writes an abstract on a given written material. He/she is supposed to be able to distinquish relevant material from irrelevant, to determine the delivery of his/her performance (a lecture, an article, a demonstration etc.) and the group to which the performance is meant. Then the applicant presents his/her issue to an entrance committee of three teachers. He/she is asked some questions concerning the aims of the abstract and the arguments he/she has made about it. An applicant is evaluated in the same manner as in the teaching situation test.

There are some slight differences in the second stage of the selection procedure depending on the university or the programme of studies. The applicant for the class teacher's programme of studies may give a demonstration of his/her ability to play some instrument and/or to draw a sketch. Students that apply to the programme for prospective handicraft teachers are tested by vocational councellors. They use standardized tests for measuring spatial factors, space perception, handiness and ability to design. Students that apply for the programme of home economics teachers are evaluated in small-group situations, where each of them first acts as a chairman and then as ordinary participants.

The systems of weighting the above parts of the entrance examination differ from programme to programme. They are furthermore quite complicated. The main stress in the selection of prospective class teachers lies on the teaching situation, and accordingly the selection of students for

the programme of handicraft stresses the structuring task. On the other hand, the selection of students for the programme of home economics stresses, because of their system of counting the points, an applicants performance in a small group situation.

In table 1 are given the numbers of applicants in different phases of the selection procedure in the university of Helsinki in 1980. Failure to come to entrance examination is remarkable, even though we use a nation-wide preliminary selection system with applicants for prospective class teacher's programme. A few years ago, before the introduction of the nation-wide system, it was reported that only 29 % of those invited to the entrance examination to the university of Jyväskylä faculty of education took part in it (Komulainen 1977, 330-336).

Table 1. The numbers of applicants for different programmes of teacher education in the University of Helsinki in 1980.

Programme for / N	prospective class teachers	prospective teachers of handicraft	prospective teachers of home economics
sent their applications	2312 (856[x])	571	531
were invited to entrance examination	265	161	120
took part in the entr. ex.	193	87	105
were accepted	80	29	29

x) These applicants said that they would rather start their studies in Helsinki University than in any other university

According to the table, 3.5 % of those that sent their applications, 41.5 % of those who took part in the entrance examination, and 31.2 % of those invited, were accepted to begin their studies for prospective class teachers. 5.1 % of students that sent their applications for prospective teachers of handicraft and 5.5 % of applicants for prospective teachers of home economics were accepted.

In summary, the selection procedure of teacher education has been developed greatly in the 70's. Competition to the few vacant places of study has led to the construction of more objective and effective entrance examinations. It has not been pointed out before that the system is more selective for female than male students, though 75 % of our teachers are female (SVT 1981, 17). Strong emphasis is put on the decisions of experienced university teachers as to the aptitude of an applicant. No psychological tests or knowledge tests of any kind are in use except with the applicants for prospective teachers of handicraft. A great majority of high school graduates willing to become teachers stay outside the entrance examinations because of the strict preliminary selection based mainly on matriculation examination results. One of the problems to be solved in the future is that of the unused capacity that this group represents.

2 PROBLEM AREAS

As was previously mentioned the general purpose of the study is to get information of the cognitive styles of those accepted to teacher education in Finland. The study is of practical reasons limited in scope: there is no way of getting information of the styles of those who were left outside teacher education. That kind of information would naturally be valuable from the viewpoint of research and the process of developing the selection system. Getting such information would, however, be an enormous task considering the number of applicants. From the viewpoint of the applicants, the inclusion of any extra tests or taks for merely research purposes would not be justified, since it might seriously impede the examination performance on the critical criteria.

Cognitive styles were chosen as the subject of the study because research in the whole area is very new in Finland, and has so far mainly concerned those who are still going to school. Theoretical background and previous studies indicate the importance of cognitive styles for the teacher's work. On one hand, they contribute to the way the teacher acts and, on the other hand, they are something that should be a target of study in teacher education since they can be assumed to increase the teacher's understanding of pupil behaviour. The two styles that were chosen are Conceptual Level and Field-Independence/Field Dependence (analytical-global). The choice was based on the fact that instruments for measuring these two styles have been tried on Finnish samples earlier (Leino, A-L 1980; Puurula 1982). Their choice is also justified by previous foreign studies: they seem, so far, to be the only ones which have been investigated in connection with teacher education or teacher's work in general.

The first problem area concerns the qualities of the students in terms of the two styles: 1 a. What are the students like in terms of their Conceptual Level? 1 b. What are the students like in terms of Field-Independence/Field-Dependence (analytical-global) dimension of cognitive style?

The second problem area concerns differences in the styles of the students participating in the three different programmes of study (class teachers, teachers of textile handicraft and home economics). Previous studies indicate that cognitive style is connected with the teacher's career choice with science and mathematics teachers being more analytical than elementary school teachers (Messick 1976). It is of both theoretical and practical interest to find out if there are differences in our sample. Problem 2. can be formulated as follows: Are there differences in the styles of the students of the three programmes of study?

The third problem concerns the relationship of the two styles with the admission criteria: 3. Are the two styles related with the admission criteria? On the basis of the background theory and previous studies it could be assumed that a relationship exists between Conceptual Level and (some of) the admission criteria. CL is a long-term developmental goal, and unlike other cognitive styles, value-laden: from the viewpoint of the teachers work it would be better to be "higher" on this dimension. It is more difficult to make assumptions concerning FI/FD, since it is considered value-free: on certain occasions an analytical way of behaving is more effective while on others it is the global way that gives better results.

The fourth problem area concerns the extreme cases of either style and their success in studies: 4. How do the extreme cases of either style succeed in their studies? This problem will be investigated by means of case studies. One might venture to assume that a low CL student has difficulties in those studies that are more theoretically oriented.

From the viewpoint of the individual student it would be recommendable to provide special help to him/her, which again, from the viewpoint of our system might prove difficult.

The fifth problem concerns those students whose performance in the teaching situation or the structuring task of the entrance examination was evaluated discrepantly by two judges. An evaluation is considered to be discrepant if the difference between the two scores is 3 points. The purpose is to find out by means of case studies what these students are like in terms of the styles and success in studies. Problem 5. can be expressed as follows: What are the cognitive styles and success in studies of those students, whose performance was evaluated discrepantly in the entrance examination?

2.1 Variables

The two approaches to cognitive style selected for the purposes of this study are Conceptual Level by Hunt (1978) and Field-Independence/Field Dependence by Witkin et al. (1971). Goldstein et al. (1978) review the literature and investigations made upon different theories of cognitive style. They summarize several correlational studies and come to the conclusion that there is a moderate overlap between various tests. Cognitive style is not, however, to be considered as unidimensional. It's rather a generic construct, much like personality. Various approaches, theories and measuring instruments all assist in the prediction of behaviour. Additional research should clarify the relationships between different methods. (see also Leino, J. 1981; Leino, A-L. et al. 1982)

Conceptual Level (variable 1.) is measured with Hunt's semiprojective Paragraph Completion Method (1978). In the PCM the subject is presented with five incomplete sentences and allowed two minutes per stem to write three

sentences on each. Variations of this method are known in educational literature from 1959 on (Goldstein et al. 1978, 142 - 147). Performance is assessed on the basis of an individual's strategy, not content. The underlying structure is an individual's Conceptual Level, the degree to which he/she is capable of differentation and integration, of abstract thinking and feelings of responsibility. Reliability of the Finnish version of the test is reported to be high (inter-rater rel. = .93; Leino, A-L. 1980)

Field Dependence (variable 2.) is measured with Witkin's Group Embedded Figures Test, GEFT (Witkin et al. 1971). The writers are aware of the limitations connected with measuring FI/FD or analytic-global style with a test of a narrow field of visual perception. On GEFT the subject is required to recognize a geometric figure embedded in a complex background. This performance is hypothesized to reflect a dimension of differentiation: the more differentiated the individual, the more (field) independent and analytic he is also in other areas of human behaviour. Evidence to support this hypothesis has been gathered from several investigations.

Reliability of GEFT in this study was computed by the Spearman-Brown formula which gave an estimate of .86. This estimate compares favorably with earlier information about the reliability of GEFT (Witkin 1971, 28). Reliability of PCM is usually computed by inter-rater coefficients, which, however, was not possible this time. Spearman-Brown formula gave an estimate of .78 and interclass correlation was .84, both of which can be considered satisfactory (see Hunt 1978, 43 about inter-rater reliabilities).

Variable 3, "entrance examination", is a composite index consisting of six different ratings given about the applicant. The performance of the applicant is assessed by three teachers, first in a teaching situation and then in an interview (see chapter 1.3). To get some information about the

agreement between the teachers, correlations between their ratings were computed. Correlations ranged from .59 to .63 in the teaching situation test and from .58 to .72 in the interview (in class teacher programmes). A word of caution is in order concerning the reliability of this index. It may not be quite justified to sum the points of teaching situation and interview. The final selection index in the entrance examination is calculated in this way, however. Cronbach alpha gave an estimate of .80, which is only a bit lower than that Komulainen (1975b) informs about in the selection of 1971. It can be considered adequate. The variable was standardized in all three sub-groups of this study.

As to the validity of the entrance examination, it was noticed in chapter 1.3 that the teaching type of test is quite valid when compared to other types of tests. Hytönen et al. (1978) give evidence of the predictive validity of the teaching situation test with success in practice teaching as the criterion. On the other hand, Jussila, M. (1975) reports that only minor predictions can be made on the basis of the results of entrance examination as to self-reported experiences in practice teaching and theoretical studies. It is obvious that the only valid criteria would concern success in the profession of the teacher. These criteria are, however, harder to come by.

Variable 3 is composed of two different types of entrance tests. Perho (1982) reports about the structuring type of the entrance examination (see chapter 1.3) that it has no correlation with the later success in teacher training either in male or female groups of class teacher students. This is a severe indication of the lack of face-validity of the type of entrance test. There may, however, be specific local reasons for the above result (the subjects of Perho's study are from the university of Joensuu). Anyhow, in this study combining of the two tests is based on the assumption that they both measure the same features an applicant.

Background information about the subjects was gathered from different sources: application registers, records on the entrance examination and several lists of course grades. Variable 4 consists of the results of the matriculation examination and variable 5 is GPA (Grade-Point - Average) of an applicant's leaving certificate from senior secondary school. Variable 6 is sex. Variable 7 is information about an applicant's previous working experience.

No complete register of the students was available, which makes data gathering in a study like this rather complicated. For example, when seeking for a reliable measure of success in theoretical studies, it was decided to use certain courses that were common to all students in different study programmes. However, the results of some of them were not to be found. They were not registered for some reason. In addition to this, exact means and deviations were impossible to compute because students can pass a course on several different examinations. On the other hand, a study like this always depends on circumstances and the information that is available. Therefore, it was decided to gather all relevant information about the extreme cases and their studies (see problems). Further description of this information is given in chapters 3.4 - 3.6.

2.2 Subjects

The subjects of this study are the students that were accepted to different programmes of teacher education in 1980 in the university of Helsinki. Subject teachers were not included in the study because in 1980 they did not have any special entrance examination. Their selection was based on documents of their previous academic career with the main criteria being achieved competence in the studies of one or two school subjects.

The students were tested in February, 1981, with PCM- and GEFT-tests during a lecture in a compulsory course that was common to all three programmes. In order to identify the students (see problems) they were asked to report their names and programmes of study. The forms were fullfilled in a group-test situation, first GEFT and then PCM.

The numbers of subjects are given in table 2. 64 % of students of class teacher programmes, 66 % of prospective teachers of handicraft and 90 % of prospective teachers of home economics were present in the test situation. Because of the tight schedule of the studies it was not possible to renew the test situation, but nevertheless the material is sufficient for research purposes and representative of the population (see also table 3).

Table 2. The subjects of the study, their programmes of study and the total numbers of students.

Programme for / N	prospective class teachers	prospective teachers of handicraft	prospective teachers of home economics
all	80	29	29
subjects in this study	51	19	26
% of all students	64	66	90

Differences in the academic ability of the students were examined by means of the results in their matriculation and secondary school leaving certificates. The means of the two were the highest in the group of class teacher students, as can be seen in table 3.

Table 3. The means and standard deviations of GPA in school leaving certificate (max 10) and in matriculation examination (max 24)
(s = sample, p = population)

Programme for	GPA				Matriculation		N_s	N_p
	$\bar{x}_s$	$\bar{x}_p$	s_s	s_p	$\bar{x}_s$	s_s		
prospective class teachers	8.6	8.6	.51	.59	20.7	2.32	51	80
prospective teachers of handicraft	8.5	8.4	.39	.5	19.6	2.66	19	29
prospective teachers of home economics	8.5	8.4	.32	.4	20.0	1.96	26	29
							96	138

The analysis of variances revealed no differences between the groups. It's worth noticing that the students represent the very highest group as to their entry level when compared with prospective class teachers in other universities in Finland. (Paakkola 1979; Uusikylä 1982)

3 RESULTS

3.1 Conceptual Level

The quality of the students' Conceptual Level is to be seen Appendix 1, which gives the distribution of the variable in the entire group. The CL of this group corresponds rather well to that of Canadian samples (Hunt 1978, 41). The means are to a large extent in accordance with a) previous results from Finnish students who were at least 18 years old (Puurula 1982) and b) with the information given by Hunt (1978, 41) about the norms for learning styles in adult samples, particularly among teacher trainees.

Table 4. The means and standard deviations. PCM. (N=96)

programme of studies	$\bar{x}$	s	N
class teacher	1.87	.34	51
handicraft	1.57	.51	19
home economics	1.60	.46	26

Results of the analysis of variance are given in table 5. The obtained value of F is 5.62, which is significant at the .005 level. The null hypothesis of no differences between the means can be rejected. There seems to exist some differences between the groups with class teacher students representing the highest Conceptual Level.

Table 5. An analysis of variance for the students. PCM.

components	SS	DF	MS	F	p(F)
between	1.9	2	.95	5.62	.005
within	15.7	93	.17		
total	17.6	95			

The total CL score is calculated in this study using all five responses. Hunt's advice is to use "top three scores" meaning the highest three responses because if a person demonstrates a high level of conceptual thinking on a few responses, he is not required to do so every time (1978, 37). Distributions calculated on the basis of the latter instruction tend to be negatively skewed.

3.2 Field-Independence/Field-Dependence

The quality of this style in our sample is to be seen in Appendix 1, which gives the distribution of the variable in the entire group. The students in this study tend to be field-independent. Means and standard deviations are given in table 6. The group of textile handicraft teacher students is the most field-independent. The psychological tests that are in use in their selection stress visual perception and this, as said before, is an important feature of GEFT.

Table 6. The means and standard deviations of GEFT.

programme of studies	$\bar{X}$	s	N
class t.	15.20	3.01	51
handicraft	15.74	2.54	19
home ec.	11.69	3.87	26

The analysis of variance (table 7) shows that the differences between the means are statistically highly significant. This may indicate either that the personalities (at least in this feature) of the students are different in different teaching areas (meaning that a certain personality seeks an opportunity to study in a certain programme) or that the selection procedure eliminates other personality types (see chapter 1.3 about the small-group situation test in the selection of home economics teacher students). The

extent to which this conclusion is justified with regard a) to the success in later studies and b) to the success in the profession of a teacher remains to be investigated in further studies.

Table 7. An analysis of variance for the students. GEFT.

components	SS	DF	MS	F	p(F)
between	265.5	2	128.3	12.62	.001
within	944.9	93	10.16		
total	1201.4	95			

It's interesting to notice the same trends as in previous investigations of this feature. Field-dependent persons tend to be socially sensitive while Field-Independent persons tend to be superior in analytical thinking (Witkin et al. 1975, 14 - 20 and Goodenough et al. 1977, 6). Teachers of mathematics and industrial arts teachers are more field-independent while teachers in elementary schools field-dependent (Witkin et al. 1975, 67; Stone 1976). Observations of teacher performance in different grades lead Stone (1975) to argue that the relation between FD/FI and teaching performance is associated with grade level and probably influenced by the teaching task.

3.3 Relationships between variables

Factor analysis was used to explore the relationships between the variables. The correlations of the nine variables (see Appendix 2) were factor analyzed using the principal components method. Four varimax-rotated factors explained 66.9 % of the total variance (Table 8). Strictly speaking there ought to be at least three variables with high loadings on each factor to get an interpretation. The significance levels of factor loadings on each factor were computed with the Burt-Banks formula (Child 1976, 97). With this criterion it was possible to interprete the factors, though some of the variables loaded on several factors. Extracting four factors though there are only nine variables is also a precarious attempt, but it can be noticed that the eigenvalues of the factors stay above the unity.

Table 8. A factor analysis for the variables. Varimax solution.

variable	I	II	III	IV	h^2
1. PCM	.46	.02	.14	.54	.53
2. GEFT	.08	-.04	.92	.05	.85
3. entrance examination	-.03	.17	-.15	.73	.58
4. matriculation results	.21	-.80	.03	-.21	.73
5. GPA	.01	-.89	.09	.05	.81
6. sex	.50	.55	.14	-.37	.71
7. previous working experience	-.33	.27	.32	.13	.30
8. programme of studies (class teachers)	.85	-.08	.27	.09	.81
9. programme of studies (handicraft)	-.75	.06	.35	-.06	.70
eigenvalue	1.9	1.9	1.2	1.0	
percentage variance	.32	.31	.20	.17	
significance level (Burt-Banks)	.26	.28	.29	.32	

The first factor has high loadings on the measures of the programme of studies, sex and PCM. If we use the Burt-Banks formula of significance of factor loadings, the variable of previous working experience must be included. The factor is bipolar with the students in the programme of class teachers representing the other pole and the students in the programme for prospective teachers of handicraft the other pole. PCM variable has a positive sign. This factor seems to repeat the findings of chapter 3.1: students of different programmes differ from each other as to their conceptual level. The first factor is named as a factor of Conceptual Level.

It's interesting to see that the variable of previous working experience is loaded on this factor with a negative sign. The communality of the variable is low, which may indicate that this variable is not particularly reliable. However, the connection of the variables of PCM and previous working experience seems to indicate in this sample that the more working experience the student has, the lower his/her conceptual level is. He/she is more apt to negative, impulsive or defensive thinking and concerned with behaving in a socially acceptable way (Hunt 1978, 4 - 5). Perhaps a student has a clear, fixed image of the work as an educator: the one that stresses authoritarian features.

The above reasoning is supported by some previous investigations. Jussila, M. (1975) reports about the connections of previous working experience and opinions concerning the utility of practice teaching that the students with long teaching experience didn't set great value on practice teaching. Perho (1982, 266) criticizes the use of previous working experience as one of the criteria in the entrance examination. According to his investigations, working experience may cause negative attitudes towards later studies. Only the kind of working experience that is not casual but based on deep personal concern is important to later success in studies and self-experienced satisfaction over career choice.

The second factor can be interpreted as a factor of entry level. It is based mainly on the high loadings of matriculation exam results and final school grades. The variable of sex has a loading of .55 on the second factor, too. It indicates the fact that female students in Finland have a better entry level when they apply to teacher training.

The third factor has a high loading the measure of FI/FD. The variables of previous working experience and programme of studies have loadings over .30, too. Significance level of the loadings of this factor is .29. The variable of programme of studies consists of students of textile handicrafts and the relative Field-Independence of textile handicraft students obviously caused this factor to appear. In some earlier studies FI/FD has been found to be related to sex with boys being more analytical than girls. Goldstein (1978, 184), however, questions this finding after a close examination of related studies. Consistent sex differences have not been found with the type of instrument used in this study (GEFT), though other types of measures of FI/FD show that differences exist (Goodenough et al. 1977, 12). The variable of sex has a minor loading on this factor. The students in the programme of textile handicraft teachers are all female and selected with a standardized test of visual perception. The factor can be interpreted as a factor of Field-Independence/Field-Dependence.

The fourth factor has high loadings on the variables of entrance examination and PCM. The higher points an applicant has got in the entrance examination, the higher his/her CL is. He/she is open to new ideas, shows concern for others' ideas and feelings. He/she seeks a compromise which is suitable to everyone, and reveals tolerance of uncertainty, ambiquity and difference of opinion (Hunt 1978). In other words, an applicant is flexible. According to many researchers this is one of the most important features of a teacher (Joyce et al. 1981). It's worth remembering that the rules of the Ministry of Education

(see chapter 1.3) emphasize flexible behaviour both in a teaching situation and in a structuring test of the entrance examination. The factor is named as a factor of entrance examination.

Komulainen reports in a series of studies about the selection process of class teacher students that though the teaching situation test seems to be valid it is nevertheless based on a certain holistic view of the personality of an applicant. Extravert personalities make better performancies in the teaching situation test. It's not, however, certain that this kind of personality is the best for the profession of a teacher. As a matter of fact, we know quite a little about the ideal features of a successful teacher. (Komulainen 1975 a and b, 1977, 1982; Hytönen & Komulainen 1978; Kansanen 1983)

It is once more to be emphasized that factor analysis was only used to describe the relationships between the variables. It's worth lies on 'soft' interpretation of the data and on the ideas it may rise. Bearing these restrictions in mind it can be said that the results were quite reasonable. They can be used in more refined study designs and replicated with bigger numbers of students and more accurate measures.

3.4 Extreme cases of Conceptual Level

The fourth problem area concerns the extreme cases of the two cognitive styles. Six cases of low CL and four cases of high CL were found (low=below 0.8, high=over 2.4). The low CL cases represent all either a programme of textile handicraft or home-economics. Of the high CL cases, one represents the programme of home-economics and three prospective class teachers. The grades of 12 courses that were held during the first two academic years were sought and a simple matrix of these studies was made (Appendix 3). The courses were all compulsory and they are evaluated from 0 (fail) to 3 (excellent). It is supposed that the evaluation is absolute as to the standards and aims of teacher education (Lahdes 1978). Five of the courses belonged to the area of research methodology and statistics and others included courses on didactics and orientation to education (Table 9).

Looking closely on the matrix one can notice that the low CL students have slightly inferior results compared to the high CL group. In Figure 1 the means of the twelve course grades of the two groups are given. Only in two courses had the lower group got better marks. One is a course in elementary statistics and the other a course in applied psychology (understanding student personality).

Figure 1. Means of 12 courses of low CL and high CL cases

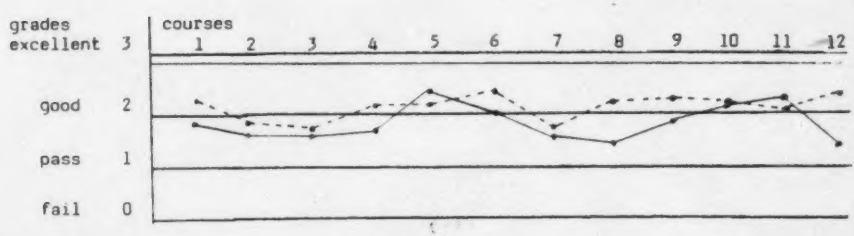


Table 9. Description of the courses

1. Preliminary course of didactics: 12 hours of lectures and reading for a test
2. Theoretical problems of a teaching situation: as above
3. Philosophical and historical foundations of educational sciences: as above
4. Methodology: 30 hours of lectures plus reading for a test
5. Basic course of statistics: 10 hours lectures, 10 hours small-group work, a test
6. Continuation course of statistics: 30 hours of lectures, 20 hours small-group work, plus a test
7. A course of gathering pedagogical data: 20 hours of lectures, 10 hours of small-group work, and an examination
8. A course of statistical inference: 12 hours of lectures, 8 hours of small-group work, reading for a test
9. A course of evaluation: 10 hours of lectures, 30 hours of small-group work, a test
10. A course of how to analyze a teaching situation: 8 hours of lectures, 18 hours of small-group work, and reading for a test
11. An introduction to understanding student personality: 12 hours of lectures, 12 hours of small-group work in the first term and 28 hours of small-group work in the second term integrated with teaching practice periods
12. A course of planning teaching: 24 hours of small-group work plus reading for a test.

Louhisola (1983) reports that the study programme of class teachers is research-orientated according to the goals of teacher education reform (see chapter 1). Courses of methodology and statistical inference are, however, among the least popular theoretical courses in students' opinion. (see also Uusikylä 1982)

If we analyze the data matrix of these extreme cases horizontally (Appendix 3), we can notice that the low CL-cases have failed a bit more or have a lower grade than "good" compared to high CL-cases. Cases 3 and 4 are the ones that have obvious difficulties with theoretical courses. The former has also a peculiar GEFT-performance: the points from the first and second part of the test differ to a great extent

from each other. She is a FD-person, while the latter case is a clear FI-case.

As a matter of curiosity, a small factor analysis using Q-methodology was carried out. Though there are only 10 persons in the analysis, and one of the basic requirements of the method is violated, it's, however, interesting to see if the persons can be grouped on bases of their study success (see Kerlinger 1975). New means of data processing is necessary to get a general tentative overview of even a few cases. Replications would be necessary to confirm the results. No generalisations concerning the population are made here.

Table 10 gives the loadings of a two factor varimax rotated factor solution. As can be seen, the low CL and the high CL groups appear on different factors. Extreme cases of Conceptual Level have succeeded in their studies in different ways.

Table 10. A varimax-rotated factor matrix of extreme students.

Factor / Student	Q-methodology I	II	h^2	CL-group
1	.89	.43	.98	low
2	.86	.48	.98	"
3	.76	.59	.93	"
4	.83	.52	.97	"
5	.85	.52	.98	"
6	.88	.46	.98	"
7	.55	.83	.99	high
8	.41	.91	.99	"
9	.55	.83	.99	"
10	.48	.88	.99	"
eigenvalue	4.8	4.9		
percentage of variance	48	49		

(see Appendix 4 for correlations and a matrix of principal components)

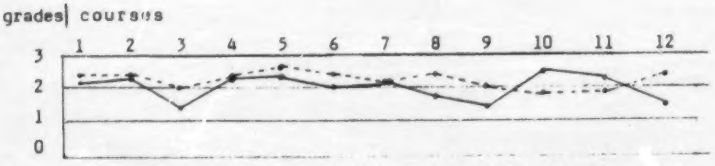
3.5 Extreme cases of FI/FD

Five cases of FD were found. They mostly represent the programme of home economics teachers, only one of them was a male student in the programme of prospective class teachers. Several cases of FI were found in this study (see also Appendix 5). They were students in the programmes of class teachers and textile handicraft. Seven of them were chosen for closer observation. No special criteria of selection was used.

Study success of these extreme cases is examined in the same manner as before. Figure 2 gives the means of these groups in the 12 courses in question.

The group of FD students is slightly inferior to the FI students in the courses. The two courses where the means "change places" concern teaching situation: a course of how to analyze a teaching situation and introduction to understanding student personality. The former is an introduction to different observational systems while the latter consists of observing one pupil. Both courses include a minor written report on the observation of a pupil.

Figure 2. Means of 12 grades of FI and FD cases



Differences are evident also in three courses of statistics: courses 6, 8 and 9. One is tempted to consider this as an indication of the validity of GEFT (see chapter 2.1).

Factor analysis with Q-methodology produced three factors that could roughly be interpreted. They are not, however, reported here, because they are of no great relevance.

3.6 Discrepant evaluation of teaching situation

Problem 5 concerns those students whose performance in the teaching situation or the structuring task of the entrance examination was evaluated discrepantly (three points' difference) by two judges. Only one case that fulfilled the criterion was found in our sample. He is a class teacher student with average entry level. His CL-score was 2 which means, according to Hunt, a person having no great need of structuring in studies. His GEFT-point was 17 referring to Field Independence.

The study success of the case is a bit above good. He has completed all courses in time. The course that were held during the first academic year he passed with excellent degrees (including courses 1, 2, 3 and 5, see table 9.). Success in theoretical courses of the second year is still graded good.

As to his studies in the subjects of elementary school, they were all taken in time and with good grades. Also, he has passed two courses of foreign languages. The only courses where his study-success has been lower than good belong to the unit named "man, nature and society" including introduction to social sciences. Instruction of this unit is given by teachers of another faculty.

Komulainen (1977) has discussed borderline cases of the entrance examination to which the case above belongs. Borderline cases usually consist of applicants who get equal points in entrance examination but on the basis of some further criteria are either accepted or dropped out. Utilization of extra criteria has decreased in teacher education centres in the 70's. The legal security of applicants has been advanced in essential parts. The case above represents another type of borderline cases. One of the three teachers in the entrance committee had evaluated

his performance in a teaching situation test as poor and another as very good. Discrepancies like this occur seldom and are of no great importance from the viewpoint of this study. Success in training was not, however, possible to evaluate in this study and remains a theme to be investigated in continuation studies.

Discrepant evaluation of teaching situation may be a mere chance or a true indication of different opinions. It can be diminished by training of evaluators and by defining the content of pedagogical skills and abilities (Falus 1982). Furthermore, a detailed analysis of the aims of education, and the aims of a teaching situation are needed to support the evaluation of students' teaching performances.

4 DISCUSSION

The purpose of the study was to get information on the cognitive styles of those accepted to teacher education in 1980. The study was mainly limited to concern the relationships between two cognitive styles (Conceptual Level and Field-Independence/Field-Dependence) and selection criteria but included also comparisons between the extreme groups of cognitive styles with regard to their success in studies and a scrutiny of a case whose performance in the teaching situation was evaluated discrepantly by the judges. The subjects were prospective class teachers and prospective teachers of textile handicraft and home economics. (Subject teachers in that year came in through the old system with their selection being based on various documents.)

The results concerning the CL showed similarity to those received in Canadian samples and earlier Finnish samples. As regards different programmes of study, prospective class teachers had the highest and prospective handicraft teachers the lowest CL. Differences between the three groups were significant. The study of the extreme cases of the CL showed that the lowest cases represented the study programmes of handicraft or home economics with only one case representing class teachers´programme. Of the highest cases three represented class teachers´ programme and one home economics. The success in studies of the low CL students was slightly inferior to that of the high CL group with two exceptions: basic course in statistics and introduction to student personality. These differences were not, however, remarkable. The biggest differences concerned planning teaching and statistical inference with the high CL cases showing clearly better results. Previous studies have shown trainee CL to be correlated with the trainee´s capacity to learn different models of teaching (Hunt 1977 - 78). If success in planning teaching reflects the trainee´s ability to learn new teaching styles, the results of our few studies refer to the same direction as previous studies.

Unfortunately at the time when data for this study was collected, no information was available on the students' success in practice-teaching situations. The other differences between the cases can obviously be explained by different degrees of structure in the courses (which naturally concerns planning teaching too), favouring different types of learners. Previous studies have shown that high CL learners profit more from low structure (or are less affected by variations in the structure), while low CL learners profit more from high structure.

As regards Field-Independence/Field-Dependence the three groups differed significantly from one another with prospective handicraft teachers being relatively the most Field-Independent and prospective home-economic teachers the most Field-Dependent. As was previously mentioned the feature was measured by means of a test of visual perception, which obviously stresses the same features as the psychological tests that are used in the selection of prospective handicraft teachers. Unfortunately no other instrument is available that could be used in a group-testing situtation. Of the extreme cases four FD cases were from the programme of home economics and one from that of class teachers. The seven FI cases come from the programmes of textile handicraft and class teachers. The results received by FD students were slightly inferior to those received by FI students. Results of two courses were, however, better for FD cases; the two courses both involve observation. As a tentative hypothesis one might venture to assume that FD students may get better results because they have been found to be more empathic, they are particularly sensitive to social environment and attentive to human content in the environment (Messick 1976).

The relationships as expressed by correlations and factor-analysis showed PCM to be a general measure of personality with relevance to the selection procedure and educational studies and with a wider scope than that of FI/FD which

is of a more specific nature and seemingly only having relevance to the entrance examination criteria of the prospective teachers of textile handicraft.

The use of factor-analysis can be criticised on account of the small number of variables in relation to the number of factors extracted. Factor-analysis was, however, only resorted to in order to get a rough, general idea of the relationships between the variables. The loadings of PCM in the analysis could be interpreted as rough indications on the validity of the examination. It must, on the other hand, be remembered that entrance examination consists of students' performance on different occasions evaluated by different judges. The variable is a combination of the various scores, which means that there may be parts in the examination with no great validity at all. In previous studies of the field the criterion has been students's success in studies. It is no wonder that the correlations have been high since entrance performance and success in studies have been evaluated by the same teacher educators. The only valid criteria would naturally be the teacher's success as a teacher, his professional activities, but these criteria are harder to come by. Since, however, CL is a style highly desirable from the viewpoint of the teacher's work our entrance examination can be considered to measure at least some aspects relevant to the prospective teacher's profession.

Only one of the students in our sample represented those whose performance in the teaching situation was evaluated discrepantly by the judges. Even though the number of those who are rejected in the entrance examination on account of discrepant evaluation is small each year, they in any case point to a weakness in the selection system which attempts at objectivity. From the viewpoint of the entire system they could be "waved aside" but from the viewpoint of an individual applicant and his right to be evaluated objectively they remind us of a procedure which may not at all points be quite justified.

As to the arrangements of the education of the prospective teachers an interesting question concerns the extent to which information on learning styles could be made use of. A student should learn to direct his own learning in independent study, he/she should learn to work cooperatively with others in group-situations, and finally he/she should also learn from highly structured lessons. Messick (1982) has pointed out how the stylistic demands of most programmes and settings are so intermixed that they neither match or mismatch stylistic learner characteristics. FD students e.g. might profit from the structure usually provided by the lecture while the impersonality of the lecture hall could be discouraging for them. On the other hand, they may welcome the interpersonal involvement of a small group but be unable to discover the desired principles on account of the lack of analytical orientation. Another interesting question concerns means of helping low CL students to develop higher CL. A low CL student should gradually be allowed less structure, more freedom of choice in decision-making, encouragement and possibilities for trying out his/her own innovative ideas. It is not quite clear to what extent this can be accomplished in our system in which a central component is the socialization of prospective teachers into the practices of the older ones. If Joyce (1981, 6) is right in saying that "no more effective method has ever been devised for preventing change in a social institution than to apprentice the novice to his/her elder" then the chances do not seem very good.

The present study is narrow in scope which is to be seen in the selection of the variables and the subjects. Of the wide area of cognitive styles we only included two in our study. On the other hand, both the theoretical background and previous studies indicated the relevance of the two styles for teacher education and teacher's profession in general. The criteria we used were those that were available at the time of data gathering. Extremely important and interesting information would have been offered by evaluations of

teaching practice situations had that kind of additional information been available. It is also regrettable that it was not possible to observe student teachers with regard to their repertory of teaching styles, since this would have given us valuable information on the verification (or falsification) of some foreign research results on a Finnish sample. It is, however, to be remembered that the area is new in Finnish educational research and represents a very central area seen against the background of all the educational reforms that have been carried out. The present study, even in its limited form, offers some new information to Finnish educational science, and a continuation study by A. Puurula will concern prospective teachers' styles of study and their relationships with success in studies.

REFERENCES

Alikoski, J. - J. Karvonen - V. Mikkonen. 1978. Opettajankoulutuksen oppilasvalintojen kehittämissuunnitelma. Opetusministeriön korkeakoulu- ja tiedeosaston julkaisusarja n:o 25.

Alikoski, J. 1981a. Opettajankoulutuksen valintatutkimusten metodologisia ongelmia ja tutkimusstrategisia näkymiä. Julkaisussa Panhelainen (toim.), 51 - 63.

Alikoski, J. 1981b. Opettajankoulutuksen opiskelijavalinnat ja niiden kehittäminen. Korkeakoulutiedote 1982, 1, 4 - 5. Opetusministeriö.

Bandura, A. 1978. "The self system in reciprocal determinism". American Psychologist 33, 344 - 358.

Braun, C. 1976. "Teacher Expectation: Sociopsychological Dynamics". Review of Educational Research 46, 2, 185 - 213.

Brophy, J. E. - T. L. Good. 1974. Teacher-Student Relationships: Causes and Consequences. New York: Holt, Rinehart & Winston.

Child, D. 1976. The essentials of factor analysis. London: Holt, Rinehart & Winston.

Cooper, H. M. 1979. "Pygmalion Grows Up: A Model for Teacher Expectation Communication and Performance Influence". Review of Educational Research 49, 3, 389 - 410.

Entwistle, N. 1981. Styles of Learning and Teaching. Chichester: John Wiley.

Falus, I. 1982. Research on Teaching Activity in Hungary. In Research on Teaching and the Theory and Practice in Teacher Training, 72 - 94. Research Report 4. Department of Teacher Education. University of Helsinki.

Feldman, R. S. - T. Prohaska. 1979. "The Student as Pygmalion: Effect of Student Expectation on the Teacher". Journal of Educational Psychology 71, 4, 485 - 493.

Frank, B. M. - J. K. Davis. 1982. "Effect of Field-Independence Match or Mismatch on a Communication Task", Journal of Educational Psychology 74, 1, 23 - 31.

Goldstein, K. M. - S. Blackman. 1978. Cognitive Style. Five Approaches and Relevant Research. New York: John Wiley & Sons.

Goodenough, D. R. - H. A. Witkin. 1977. Origins of the Field-Dependent and Field-Independent Cognitive Styles. Research Bulletin 9. Educational Testing Service. Princeton, New Jersey.

Harvey, O. J. - D. E. Hunt - H. M. Schroder. 1961. Conceptual Systems and Personality Organization. New York: John Wiley & Sons.

Heikkinen, V. 1981. "Keskustelemme tavoitteista", In Seppo, 213 - 217.

Heikkinen, V. 1982. Valuing, Attitude and Behavior. 8th International Congress of W.A.E.R. August 2 - 6, 1982. Helsinki. Finland.

Hunt, D. E. 1971. Matching Models in Education. OISE.

Hunt, David E. - Edmund V. Sullivan. 1974. Between Psychology and Education. USA: Dryden Press.

Hunt, D. E. 1975. "Person-Environment Interaction: A Challenge Found Wanting Before It Was Tried." Review of Educational Research 45, 2, 209 - 230.

Hunt, D. E. 1976. "Teachers' Adaptation: 'Reading' and 'Flexing' to Students." Journal of Teacher Education 27, 3, 268 - 275.

Hunt, David E. 1977 - 78. "Conceptual Level Theory and Research as Guides to Educational Practice." Interchange 8, 4, 78 - 90.

Hunt, D. E. - L. F. Butler - J. E. Noy - M. E. Rosser. 1978. Assessing Conceptual Level by the Paragraph Completion Method. Ontario Institute for Studies in Education. Informal Series 3.

Hunt, D. E. - B. R. Joyce. 1981. "Teacher Trainer Personality and Initial Teaching Style." In Joyce & al.

Hytönen, J. 1982. Opettajankoulutuksen teoria-aineksia. Käytännön sovellutuksena Helsingin yliopiston luokanopettajan koulutusohjelma. Tutkimuksia 1. Helsingin yliopiston opettajankoulutuslaitos.

Hytönen, J. - E. Komulainen. 1978. Opettajankoulutuksen oppilasvalinnan opetustuokio pyrkijöiden kokemana ja opetusharjoittelussa menestyminen. Kasvatus 9, 4, 265 - 270.

Joyce, B. R. 1981. "The Roots of Humanity: Views of Humankind and the Education of Teachers." In Joyce & al.

Joyce, B. - C. C. Brown - L. Peck. (eds.) 1981. Flexibility in Teaching. New York: Longman.

Jussila, M. 1975. Valintakokeen ja erilaisten opintojen yhteyksistä opettajankoulutuslaitoksen I vuosikurssin nimikkoluokkaharjoittelussa saatuihin kokemuksiin. Oulun yliopiston käyttäytymistieteiden laitoksen julkaisuja 23. (Institute of Behavioral Sciences. University of Oulu.)

Kansanen, P. 1983. Opettajankoulutus tutkimuskohteena. Virkaanastujaisesitelmä. To appear in Kasvatus 1/1983.

Kerlinger, F. N. 1975. Foundations of Behavioral Research. Holt, Rinehart & Winston.

Komulainen, E. 1975. Vuoden 1971 valintakokeen toimiminen eri opettajankoulutuslaitoksissa. Kasvatus 6, 114 - 120.

Komulainen, E. 1975b. Opettajankoulutukseen pyrkijöiden käyttäytymisestä opetustuokiossa. Kasvatus 6, 6, 398 - 403.

Komulainen, E. 1977. Luokanopettajavalintojen tarkastelua kahdessa valmistusyksikössä v. 1975. Kasvatus 8, 330 - 336.

Komulainen, E. 1979. Eräitä näkökohtia opiskelijavalinnoista. Julkaisussa Raportti opiskelijavalintoja käsittelevästä teemapäivästä 13.11.1978, toim. Koskinen, Ilse. Helsingin yliopisto. Opintoasiaintoimisto. Sarja B: selosteita 4.

Komulainen, E. 1982. Opetustuokio ja haastattelu luokanopettajan koulutuksen valinnoissa. Julkaisussa Aineenopettajakoulutuksen opiskelijavalinnat. Opetusministeriön korkeakoulu- ja tiedeosaston julkaisusarja n:o 43.

Lahdes, E. 1978. Opetustaidon arvioinnin perusteista. Julkaisussa Luokanopettajan koulutusohjelman yleinen rakenne. Kasvatusalan tutkinnonuudistuksen ohjaus- ja seurantaprojektin raportti. Opetusministeriön korkeakoulu- ja tiedeosaston julkaisusarja, n:o 27. Helsinki.

Leino, A-L. 1980. Learning Process in Terms of Styles and Strategies: Theoretical Background and Pilot Study. Research Bulletin n:o 54. Institute of Education. University of Helsinki.

Leino, A-L. ja J. 1982. Oppimisvaikeudet kognitiivisten prosessien näkökulmasta. Tutkimuksia 97, Helsingin yliopiston kasvatustieteen laitos.

Leino, J. 1981. Psychometric Test Theory and Cognitive Processes: A Theoretical Scrutiny and Empirical Research. Research Bulletin n:o 57. Institute of Education, University of Helsinki.

Letteri, C. A. 1982. Cognitive Profile: Relationship to Achievement and Development 8th Congress of W.A.E.R. August 2 - 6, 1982. Helsinki. Finland.

Louhisola, O. 1983. Kasvatustieteen opinnot luokanopettajankoulutuksessa. Käsikirjoitus.

Marklund, S. - B. Gran. 1974. "Research and Innovation in Teacher Education," in OECD, 15 - 80.

Messick, S. & Associates. 1978. Individuality in Learning. San Francisco: Jossey - Bass.

Messick, S. 1982. Cognitive Styles in Educational Practice. Research Bulletin. Educational Testing Service. Princeton New Jersey.

Mietintö 1975:75. Vuoden 1973 opettajankoulutustoimikunnan mietintö. Helsinki.

Mietintö 1975. A Proposal for the degree and syllabus reform of teacher education in the Finnish institutions of higher education. A summary of the report by the 1973 Committee on teacher education. Helsinki 1975.

OECD. 1974. New Patterns of Teacher Education and Tasks. Country Experience. Sweden. Paris.

Opetusministeriö. 1977. Peruskoulun ja lukion opettajien peruskoulutuksen opiskelijavalinnat.

Opetusministeriö. 1980. Opettajankoulutuksen opiskelijavalintojen täydentävät ohjeet ja suositukset vuodelle -80.

Paakkola, Esko - Salminen, Jaakko. 1979. Luokanopettajakoulutuksen valintamenettely ja valintasuoritusten yhteydet valituksi tulemiseen Joensuun korkeakoulussa 1978. Joensuun korkeakoulu, Kasvatustieteiden osaston selosteita ja tiedotteita n:o 15.

Panhelainen, M. (toim.). 1981. Korkeakoulutus tutkimuksen kohteena. Jyväskylässä 26. - 27.5. järjestetyn korkeakoulututkimuksen symposiumin artikkelit. Jyväskylän yliopiston kasvatustieteiden tutkimuslaitoksen selosteita ja tiedotteita.

Perho, H. 1982. Ammatti- ja opintosuuntautumisen luonne ja merkitys luokanopettajan opinnoissa. Joensuun korkeakoulun julkaisuja. Sarja A, n:o 23.

Puurula, A. 1982. Oppimisstrategioiden tutkimus käytännön opetustyön kannalta. Kasvatus 1, 33 - 39.

Rappaport, M. M. - H. Rappaport. 1975. "The Other Half of the Expectancy Equation: Pygmalion". Journal of Educational Psychology 67, 4, 531 - 536.

Salomon , G. 1981. Communication and Education. London: Sage Publications.

Seppo, S. (toim.). 1981. Ihmisen kasvu ja sosiaalistuminen. Joensuun korkeakoulun julkaisuja A, n:o 20, 213 - 217.

Stone, M. K. 1976. The Role of Cognitive Style in Teaching and Learning. Journal of Teacher Education. Vol. XXVII, n:o 4, 332 - 334.

SVT. 1981. Suomen virallinen tilasto XXXVII:9.

Uusikylä, K. 1982. Opettajankoulutus prosessina. Seurantatutkimus Helsingin yliopiston opettajankoulutuslaitoksen luokanopettajan koulutuslinjalla. Käsikirjoitus.

Witkin, H. A. - C. A. Moore - D. R. Goodenough - P. W. Cox. 1975. Field-Dependent and Field-Independent Cognitive Styles and Their Educational Implications. Research Bulletin 24. Educational Testing Service. Princeton. New Jersey.

Witkin, H. A. - C. A. Moore - P. K. Oltman - D. R. Goodenough - D. R. Ower - E. Raskin. 1977. "Role of the Field-Dependent and Field Independent Cognitive Styles in Academic Evolution: A Longitudinal Study". Journal of Educational Psychology 69, 3, 197 - 211.

Appendix 1

Table 1. Distributions of PCM-points

$\bar{x}_{CLS}$	0 - 0.9	1.0 - 1.4	1.5 - 1.9	2.0 -	N
Frequencies	7	14	58	17	96
%	7.3	14.6	60.4	17.7	100 %

Table 2. Distribution of GEFT-points

Points	0-3.0	3.1-6.0	6.1-9.0	9.1-12.0	12.1-15.0	15.1-18.0	N
Frequencies	2	2	7	12	26	47	96
%	2.1	2.1	7.3	12.5	27.1	49	100%

Appendix 2

Table 3. Intercorrelations of variables

	1	2	3	4	5	6	7	8	9
1	1.00								
2	.10	1.00							
3	.03	-.04	1.00						
4	-.08	.05	-.12	1.00					
5	-.02	.06	-.10	.62	1.00				
6	.02	.08	.02	-.12	-.38	1.00			
7	-.13	.08	.05	-.23	-.09	-.01	1.00		
8	.33	.25	.01	.17	.13	.33	-.11	1.00	
9	-.19	.19	-.02	-.14	-.04	-.16	.12	-.53	1.00

Table 4. A factor analysis of variables. Principal components solution

Factor Variable	I	II	III	IV
1 PCM	-.38	.36	.09	.50
2 GEFT	.16	.08	.91	.04
3 entrance examination	-.13	.21	-.16	.70
4 matriculation results	.62	-.57	.02	-.14
5 GPA	.52	-.71	.10	.14
6 sex	.10	.69	.08	-.47
7 previous	-.40	.08	.35	.13
8 w.e. class t.	.76	.44	.18	.02
9 handicraft t.	-.64	-.36	.43	.01
eigenvalue	1.99	1.8	1.2	1.02
percentage variance	22.1	20.1	13.4	11.4
cum %	22.1	42.1	55.5	66.9

Appendix 3

A matrix of study success of extreme cases. PCM-points.

case	course 1	2	3	4	5	6	7	8	9	10	11	12	$\bar{x}$	CL	
1	2+	3+	2	3	3	3	3	2-	3	2+	2.5	2	2.6	0.7	
2	3-	3	(1)	(1+)	2	2	2	2	2+	3-	2	2	2.1	0.8	
3	2	(1)	2	(1)	2+	2	2	(1)	(1)	2-	2.5	(1)	1.5	0.8	low
4	(1-)	(1-)	2	2-	2	(1+)	(1)	(1)	(1)	2	2	(1.5)	1.0	0.8	
5	2-	(1+)	2	2	3	2	2	2-	3	2-	2-	(1)	1.9	0.8	
6	2	(1)	(1)	2	2	2	2	3	2	2+	2+	(1+)	1.9	0.7	
7	2	(1+)	2	2-	2	3	(1+)	2+	2	2	2.5	2+	2.0	2.4	
8	2	(1+)	(1)	2+	2	2	2+	3-	2	2.5	2	2.5	2.0	2.3	
9	2	3	2	2-	3-	2	(1+)	2	2	2	(1.5)	2.5	2.1	2.3	high
10	3	2	2	3-	2	2	2	2	3	2	2	2	2.2	2.8	

Appendix 4

Table 5. A Factor analysis in Q-methodology. Principal components solution.

Factor / Student	I	II	h^2
1	.95	-.28	.98
2	.96	-.22	.98
3	.96	-.07	.93
4	.97	-.17	.97
5	.97	-.19	.98
6	.96	-.25	.98
7	.97	.24	.99
8	.91	.40	.99
9	.97	.24	.99
10	.94	.33	.99
Eigenvalue	9.13	.65	
Percentage of variance	91	6.5	97.8

Table 6. A matrix of correlations of 10 students

1									
2	.20								
3	.20	-.05							
4	-.12	-.31	.52						
5	.38	-.18	.24	-.08					
6	-.19	.10	-.15	-.26	.29				
7	-.35	-.20	.13	.29	.02	.34			
8	-.26	.13	-.37	-.24	-.08	.15	.22		
9	.15	.34	-.23	.16	-.09	-.47	-.12	-.29	
10	.18	.10	-.16	-.28	.34	.10	-.13	.03	-.16

Appendix 5

A matrix of study success of extreme cases. GEFT.

case \ course	1	2	3	4	5	6	7	8	9	10	11	12	$\bar{x}$	GEFT	
1	2	2	3	2	2+	2	(1+)	2	(1)	2	2-	(1+)	1.7	6	
2	3-	3	3	3	3	2	3	(1)	(1)	2-	2	2	2.1	3	
3	2+	3+	(1)	2+	2	2	2	(1+)	3	3	2+	2	2.2	6	FD
4	2-	(1-)	(1)	2	2	2	2	2	(1)	3-	2	2	1.8	7	
5	2+	2-	(1)	2	2	2	2	(1)	2	3	3	2	1.9	3	
6	3	(1)	3	3-	3	2	3	3	2	3	(1)	3	2.3	18	
7	3	(1)	2	3-	3-	2	(1+)	3-	2	2	2-	2+	2.0	18	
8	2	(1)	2	2+	3	3	(1)	(1)	(1)	(1)	(1.5)	(1)	1.4	18	FI
9	3-	2-	(1)	3	(1)	3	3-	3	3	3-	2.5	2.5	2.4	18	
10	2	2-	(1)	2	2	2	(1+)	3-	2	2-	2	2-	1.9	18	
11	(1)	3	2	2	3-	2	2	3-	2	2	2.5	2+	2.1	18	
12	2-	3	3	2+	2	2	2	3-	2	(1)	(1.5)	2	2.1	18	

Research Bulletin, Institute of Education, University of Helsinki

xNo 1 The Effectiveness of Punishments and the School Climate by OLLI SIPINEN. May, 1957. 10 pp.

No. 2 The Balance of Instructional Situations by MATTI KOSKENNIEMI. Nov., 1957. (reprint 1972). 7 pp.

xNo. 3 On Deceit Practiced in Finnish Grammar Schools at Written Tasks by OLAVI PÄIVÄNSALO. Nov., 1957. 5 pp.

No. 4 Comparison between Reading Comprehension and Reading Aloud by KAISA HÄLINEN. March, 1958. 9 pp.

xNo. 5 Ten Test-Papers in the Swedish Language as Graded by Ten Teachers by VÄINÖ HEIKKINEN & ANITA HAVELA. Sept., 1958. 5 pp.

xNo. 6 The Awarding of School Marks by TOIVO VAHERVUO. Sept., 1958. 5 pp.

xNo. 7 Some Comments on the Uniformity of the 'Experimental Period' in the History of Soviet Education by MATTI KOSKENNIEMI. Feb., 1959. 18 pp.

xNo. 8 Motives for the Choice of the Teaching Profession Correlated with Success in the Entrance Examination and in Student Teaching by MATTI KOSKENNIEMI. Feb., 1960. 11 pp.

xNo. 9 One's Own Teacher and the Choice of Teaching Profession by MATTI KOSKENNIEMI & EIVI LIHTONEN. Sept., 1960. 14 pp.

xNo. 10 The Curriculum of School Mathematics and Mathematical Performance. An Experimental Study by PAAVO MALINEN. Sept., 1961. 50 pp.

xNo. 11 Prognostic Value of Some Psychological Test Results Correlated with Student Teaching Marks by MARJA-LEENA KÄYHTY. Dec., 1961. 10 pp.

xNo. 12 Factors Constituting Classroom Climate by OLLI SIPINEN. March, 1963. 10 pp.

xNo. 13 On the Changes in the Educational Attitudes of Young Teacher by VÄINÖ HEIKKINEN. March, 1963. 14 pp.

xNo. 14 Teacher Training in Retrospection. A Preliminary Report by VÄINÖ HEIKKINEN. Feb., 1964. 21 pp.

No. 15 Placement of Young Elementary School Teachers by MATTI KOSKENNIEMI. May, 1965. (reprint 1972). 9 pp.

xNo. 16 Some Problems in Combining the Individual Tutors' Marks into a Final Mark in Teaching Ability by JOHANNES ALIKOSKI. March, 1966. 25 pp.

No. 17 The Finnish Senior Secondary Research Project I. General Presentation of the Project and Its Original Subjects by ANNA-LIISA SYSIHARJU. Sept., 1967. 31 pp.

xNo. 18 The Finnish Senior Secondary Research Project II. Departure from Junior Secondary and Transfer to Senior Secondary by ANNA-LIISA SYSIHARJU. Oct., 1967. 52 pp.

No. 19 Relationships between Absences from School and Certain Factors Related to School. A Study on Elementary School Grades Three to Six by PERTTI KANSANEN. Nov., 1967. 10 pp.

No. 20 On the Anxiety Associated with School Attendance and the Grammar School Entrance Examination by EEVA PATJAS. May, 1968. 16 pp.

No. 21 School Achievement and Personality. I: Design and Hypotheses, IV: Results and Discussion by ERKKI A. NISKANEN. Oct., 1968. 51 pp.

No. 22 School Achievement and Personality. II: Operations at the Variable Level by ERKKI A. NISKANEN. Oct., 1968. 124 pp.

No. 23 School Achievement and Personality. III: Operations at the Factor Level by ERKKI A. NISKANEN. Oct., 1968. 39 pp.

No. 24 The Effectiveness of Two Methods of Teaching English as a Foreign Language in Some Finnish Secondary Schools by DANIEL J. CASEY. Nov., 1968. 37 pp.

No. 25 The Learning of Elementary Algebra. An Empirical Investigation of the Results of Learning in a Simplified School Learning System by PAAVO MALINEN. Jan., 1969. 85 pp.

xNo. 26 Investigations into the Instructional Process. I. Some Methodological Problems by MATTI KOSKENNIEMI and ERKKI KOMULAINEN in collaboration with Anna-Kaarina Falck and Pentti Holopainen. Oct., 1969. (reprint 1972). 35 pp.

No. 27 Investigations into the Instructional Process. II. Objectivity of Coding in a Modified Flanders Interaction Analysis by ERKKI KOMULAINEN. Dec., 1970. 26 pp.

No. 28 Investigations into the Instructional Process. III. P-technique Treatment of Observational Data by ERKKI KOMULAINEN. Jan., 1971. 41 pp.

No. 29 Investigations into the Instructional Process. IV. Teaching as a Stochastic Process by ERKKI KOMULAINEN. Feb., 1971. 24 pp.

No. 30 Investigations into the Instructional Process. V. Experiences with the Bellack Classification System by KAI KARMA. Jan., 1972. 16 pp.

xNo. 31 Investigations into the Instructional Process. VI. Group Work as a Social Interaction Process. A Case Approach by PENTTI HOLOPAINEN. May, 1972. 34 pp.

No. 32 Investigations into the Instructional Process. VII. Non-verbal Behaviour in Group Work. Observational Technique and Typology of Pupils' Work by MARJA MARTIKAINEN. Sept., 1972. 18 pp.

xNo. 33 English School Achievements and Some Student Characteristics. I. On the Relationships of Personality and Intelligence Variables to English School Achievements by ANNA-LIISA LEINO. Oct., 1972. 50 pp.

No. 34 Investigations into the Instructional Process. VIII. On the Problems of Variable Construction from Flanders' Interaction Matrix with Special Emphasis on the Stochastic Nature of Classroom Communication by ERKKI KOMULAINEN. Feb., 1973. 78 pp.

No. 35 Zur Problematik des Unterrichts by CHR. PETROW CHRISTOW. April, 1973. 11 pp.

No. 36 Investigations into the Instructional Process. IX. Pupils' Goal-related Behavior during the Instructional Interaction by MATTI KOSKENNIEMI & PENTTI HOLOPAINEN. June, 1973. 17 pp.

xNo. 37 The Behaviour of Supervisors assessed by Student Teachers by SEPPO KONTIAINEN. Nov., 1973. 186 pp. Out of print.

xNo. 38 The Ability to Structure Acoustic Material as a Measure of Musical Aptitude. I. Background Theory and Pilot Studies by KAI KARMA. Nov., 1973. 19 pp.

xNo. 39 Investigations into the Instructional Process. X. Report of the DPA Helsinki, Phase One by MATTI KOSKENNIEMI & ERKKI KOMULAINEN. Feb., 1974. 35 pp.

xNo. 40 English School Achievements and Some Student Characteristics II. On the Relationships of Motivational and Auditory Variables to English School Achievements. Final Analyses by ANNA-LIISA LEINO. March, 1974. 48 pp.

No. 41 Foreign Language Curriculum. An Investigation into Objectives, Achievements and Student Characteristics by ANNA-LIISA LEINO. June, 1974. 27 pp.

xNo. 42 DPA Helsinki System for Describing Instructional Process. Manual. Prepared and edited on behalf of the Research Team DPA Helsinki by MATTI KOSKENNIEMI, KAI KARMA and MARJA MARTIKAINEN. Nov., 1974. 34 pp.

x No. 43 The Ability to Structure Acoustic Material as a Measure of Musical Aptitude. 2. Test Construction and Results by KAI KARMA. Feb., 1975. 21 pp.

No. 44 A Comparison of the Importance of Objectives in Foreign Language Instruction as Rated by In-Service Teachers, Student Teachers and Pupils by ANNA-LIISA LEINO. June, 1975. 35 pp.

No. 45 Implementation of Some Affective Objectives in Different Foreign Language Teaching Situations as Rated by Student Teachers by ANNA-LIISA LEINO. Nov., 1975. 45 pp.

No. 46 The Need Felt for In-Service Education by Foreign Language Teachers by ANNA-LIISA LEINO. March, 1976. 53 pp.

x No. 47 The Ability to Structure Acoustic Material as a Measure of Musical Aptitude. 3. Theoretical Refinements by KAI KARMA. Aug., 1976. 32 pp.

No. 48 Structural Elements of the Instructional Process: Activity Forms and Content. DPA Helsinki Investigations I by MATTI KOSKENNIEMI. Dec., 1977. 36 pp.

x No. 49 Research in Teaching. Papers presented at the symposion arranged by the Academy of Finland for evaluation of the DPA Helsinki Project, Helsinki, October 26th and 27th 1977. DPA Helsinki Investigations II edited by ERKKI KOMULAINEN and MATTI KOSKENNIEMI. June, 1978. 152 pp.

No. 50 An Introduction to the Content of Foreign Language Instruction by ANNA-LIISA LEINO . June, 1978. 80 pp.

x No. 51 The Ability to Structure Acoustic Material as a Measure of Musical Aptitude. 4. Experiences with Modifications of the Acoustic Structuring Test by KAI KARMA. Dec., 1978. 51 pp.

x No. 52 The Ability to Structure Acoustic Material as a Measure of Musical Aptitude. 5. Summary and Conclusions by KAI KARMA. March, 1980. 33 pp.

x No. 53 The Electronic Hand Calculator in Finnish Comprehensive School Mathematics Teaching by JOHANNES PAASONEN. Oct., 1980. 50 pp.

No. 54 Learning Process in Terms of Styles and Strategies: Theoretical Background and Pilot Study by ANNA-LIISA LEINO. Dec., 1980. 40 pp.

x No. 55 Emotion and Cognition in Visual Art Education by INKERI SAVA. March, 1981. 46 pp.

No. 56 Classroom Analysis: Concepts, Findings, Applications. DPA Helsinki Investigations III edited by ERKKI KOMULAINEN and PERTTI KANSANEN. May 1981. 52 pp.

x No. 57 Psychometric Test Theory and Cognitive Processes: A Theoretical Scrutiny and Empirical Research by JARKKO LEINO. October 1981, 74 pp.

No. 58 On the Dynamics of Undergraduate Performance and Dropout by KAJ MALM. April, 1982. 14 pp.

No. 59 Learning Process in Terms of Styles and Strategies: Case Studies by ANNA-LIISA LEINO. May, 1982. 51 pp.

No. 60 Research Project on Educational Aims by ERKKI A. NISKANEN & al. June, 1982. 105 pp.

No. 61 Admission to Teacher Education and Two Cognitive Styles by Anna-Liisa Leino — Arja Puurula. June, 1983. 54 pp.

x) Out of print.